

## **REMARKS/ARGUMENTS**

Reconsideration and withdrawal of the rejections of the application are respectfully requested in view of the amendments and remarks herewith, which place the application into condition for allowance. The present amendment is being made to facilitate prosecution of the application.

### **I. STATUS OF THE CLAIMS AND FORMAL MATTERS**

Claims 1-4, and 6-18 are currently pending. Claims 4 and 5 are hereby canceled without prejudice or disclaimer of subject matter. Claims 1, 12 and 18, which are independent, are hereby amended. No new matter has been introduced. Support for this amendment is provided throughout the Specification as originally filed. Changes to claims are not made for the purpose of patentability within the meaning of 35 U.S.C. §101, §102, §103, or §112. Rather, these changes are made simply for clarification and to round out the scope of protection to which Applicants are entitled.

### **II. REJECTIONS UNDER 35 U.S.C. §103(a)**

Claims 1-7 and 9-18 were rejected under 35 USC §103(a) in view of U.S. Patent No. 6,332,030 (Manjunath). Claim 8 was rejected under 35 USC §103(a) in view Manjunath and U.S. Patent No. 5,915,027 (Cox et al.).

Claim 1 is distinguished from Manjunath by at least the following features:

- That the data which is formed in the transform domain representation is arranged to the effect that the data is embedded in only a first low vertical, high horizontal

spatial frequencies sub-band and only a second high vertical, low horizontal spatial frequencies sub-band of the discrete wavelet transform domain representation of the data.

- That the data is formed into the first and second sub-bands with the effect that the data is embedded in a vertical scan direction in the first low vertical, high horizontal spatial frequencies sub-band and a horizontal scan direction in the second high vertical, low horizontal spatial frequencies sub-band, the scan direction being therefore in the same direction in the sub-band as the direction of the low spatial frequencies of the image.

As understood by Applicants, Manjunath relates to an image processing arrangement in which a watermark is introduced into an image using the discrete wavelet transform. Although Manjunath discloses that data should be hidden in the low frequency discrete wavelet transform sub-bands (column 3, lines 35 to 41, column 6, lines 30 to 33) there is no disclosure of the distinguishing features set out above. In column 11, lines 4 and 12 Manjunath proposes introducing the data into each of the sub-bands of the image. Moreover in column 21, lines 1 and 5 and example 5 with reference to Figure 26, it is proposed to introduce the data into the second order high horizontal, high vertical frequencies sub-band of the first order low vertical, low horizontal frequencies sub-band of a second order discrete wavelet transform. Thus, there is no disclosure in Manjunath of introducing the data into only the high horizontal, low vertical frequencies sub-band and the low horizontal, high vertical frequencies sub-band.

As explained by Applicants previously, and with reference to the explanation provided in the patent application on page 4, lines 4 and 25, introducing the data into the first low vertical, high horizontal spatial frequencies sub-band and a second high vertical, low horizontal spatial frequencies sub-band provides an improved likelihood of detecting the embedded data while reducing the effects of the embedded data on the image. This is because transform domain data from the high horizontal, high vertical frequencies sub-band is more

likely to be lost or disturbed as a result of compression. On the other hand, writing data into the low vertical, low horizontal frequencies sub-band (as Manjunath suggests) could be more disturbing to the image because the human eye is more sensitive to low frequency components than it is to high frequency components. Accordingly, the invention according to Claim 1 has a particular advantage which cannot be derived from the teaching of Manjunath.

Moreover, Claim 1 recites writing the data into the first and second sub-bands in the vertical scan direction and the horizontal scan direction respectively. As explained in the response to the previous Office Action writing the data in a scan direction which is the same as that of the low spatial frequencies of the sub-band has an effect of introducing the data into the low spatial frequencies of the image more than the high spatial frequencies of the image. As a result it is more likely that the data can be recovered from the image because the low spatial frequencies have lower energy than the high spatial frequencies of the image or conversely a strength with which the data is added to the image can be reduced thereby reducing a likelihood that the data added as a watermark in the image will be detectable by the human eye.

It is therefore submitted that Claim 1 is patentable. Applicants submit that Manjunath provides none of the above teaching and does not disclose or suggest the features of Claim 1.

For reasons similar to or somewhat similar to those described above with regard to independent claim 1, amended independent claims 12 and 18 are also believed to be patentable.

Therefore, Applicants submit that independent claims 1, 12 and 18 are patentable.

### III. DEPENDENT CLAIMS

The other claims are dependent from one of the independent claims, discussed above, and are therefore believed patentable for at least the same reasons. Since each dependent claim is also deemed to define an additional aspect of the invention, however, the individual reconsideration of the patentability of each on its own merits is respectfully requested.

### CONCLUSION

In the event the Examiner disagrees with any of statements appearing above with respect to the disclosure in the cited reference, or references, it is respectfully requested that the Examiner specifically indicate those portions of the reference, or references, providing the basis for a contrary view.

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In view of the foregoing amendments and remarks, it is believed that all of the claims in this application are patentable and Applicants respectfully request early passage to issue of the present application.

Respectfully submitted,

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